

November 17, 2017

Governor Roy Cooper
North Carolina Office of the Governor
20301 Mail Service Center
Raleigh, NC 27699-0301

Dear Governor Cooper,

Thank you for joining the State of North Carolina to the US Climate Alliance. There is much to do in terms of our state's Anthropogenic Climate and energy innovation response that also keeps our civilization reliable.

One of our next steps is to become a recognized Zero Emission Vehicle state by adding fuel cell electric vehicles (FCEVs) and the required hydrogen fueling stations. Zero Emission Vehicles include FCEVs and there is no reason for folks to prevent FCEVs coming to our state. As you look over my website SustainNC.com you will see hydrogen issues are not my only interest, but if North Carolina continues to cherry pick sustainability solutions we will miss the boat. I ask your support and allowing my participation in these multitude solutions, Governor Cooper.

If you have ever wondered why there is no discussion of fuel cells for grid or transportation application in North Carolina, I can tell you all about that. I was the NC project manager for the historic Hydrogen Road Tour.

You have the power to set us on course to installing the first hydrogen fueling stations in North Carolina as the Volkswagen settlement allows for at least two of these stations in our state. Also there is a backdoor to allowing for accurate study of such CleanTech in HB 589, the Competitive Energy Solutions for NC bill you signed this year.

This week I also shared a related letter to the NC Legislative Commission on Energy Policy. I sent it to: contactgov@nc.gov as well.

FCH2 is part of the Anthropogenic Climate and energy innovation solution

Now is the right time to educate our citizens as to our state role as a heavy energy use state and *all* the non-nuclear / low carbon potential Anthropogenic Climate and energy innovation measures available to us, Governor Cooper. I look forward to covering how Sustain NC and its several programs are for the State of North Carolina, Sir.

- You may have heard there is no place for fuel cell and hydrogen infrastructure (FCH2) in our state. I know this is conventional wisdom among the energy and environments nonprofits that lobby North Carolina state and local government daily. Along with other important measures Duke Energy eliminated any mention of FCH2 in their 2017 Integrated Resource Plan.

I would like to help change these errors and omissions if you are willing. I am interested in what you, NC DEQ, and NCLEG members know about FCH2 either way.

- I would like to participate in the HB 589 energy storage study as a North Carolina FCH2 stakeholder. There are megawatt scale hydrogen electrolyzers on the market and there is no reason for North Carolina citizens to be in the dark.
- In order to stimulate deployment of of CleanTech hydrogen use in North Carolina I am willing to help organize the NC Zero Emission Vehicle and Grid Fuel Cell Task Force, with proper support.
- I requested North Carolina Policy Collaboratory to allow my active participation in the HB 589 energy storage study. I request that you green light such collaboration, Governor. I am communicating with the NCLEG leadership as well but there's been no response. But when you signed HB 589 there was a lot of moving parts for further CleanTech policy work. This energy storage study is a good place to set the bar properly for an even, empirical approach to these complex, new issues.

It is simple matter to write out a definition of energy storage that includes hydrogen that your office, NC Joint Legislative Commission on Energy Policy, and NC DEQ approves for NCLEG purposes. I am providing the evidence on FCH2 and I would like to work with you on this important missing part of the HB 589 energy storage study as just one place where I am contributing to state sustainability innovation outcome, Sir.

Also as to FCH2 issues for our state:

- Prior to identifying the North Carolina Volkswagen settlement beneficiary there needs to be discussion of fuel cell electric vehicles on the roads and highways of our state.
- Among other resources I would like to share an important new contribution to the COP23 events in Bonn this fall you may not be aware of as to the potential of FCH2, Governor Cooper:

Hydrogen could deliver one fifth of world carbon cuts by 2050: industry group

<https://www.reuters.com/article/us-climatechange-accord-hydrogen/hydrogen-could-deliver-one-fifth-of-world-carbon-cuts-by-2050-industry-group-idUSKBN1DD25F>

I would like to share the report the Hydrogen Council submitted at COP23. This is not the report on the Hydrogen Council website.

I would be happy to share the Hydrogen Council report but keep in mind I am one of the only, if not the only, person in North Carolina with a website like HydrogenNC.com and a presentation like the one on that website. I need to share the report findings in the above Reuters story with states like North Carolina... but I need backing to do that, Governor Cooper.

I don't expect everything from you and the State of North Carolina, but including FCH2 in our Anthropogenic Climate and energy innovation portfolio apparently means including me. As far as I can tell except for a few research programs there is no one in our state covering FCH2 and the examples of other missing information I utilize.

Also keep in mind that like many 'think tank' special interest organizations the Hydrogen Council do have their blind spots. As far as I can tell they are weak as to the current state of stationary fuel cells for example. I want to see North Carolina working with a mixture of the best Anthropogenic Climate and energy innovation solution providers, Sir.

I have enough research to start and have the starting points for identifying the global FCH2 partners for North Carolina's first hydrogen fueling stations. The HB 589 energy storage study needs to be inclusive of hydrogen. With proper support I can begin search for property for the stations, Governor. Unfortunately I am not being paid to provide these solutions for the people of North Carolina.

There is a McGraw-Hill textbook on these matters titled *Green Electrical Energy Storage: Science and Finance for Total Fossil Fuel Substitution*. Hydrogen related systems are at least in part covered in Chapter 2. I have shared the US Department of Energy *Quadrennial Energy Review* and *Quadrennial Technical Review* references to energy storage that include for hydrogen as well with the HB 589 players, Governor. There's more.

Various North Carolina special interests are limiting our energy innovation

FCH2 issues are part of what I have learned as to our Anthropogenic Climate and energy innovation response since taking a physical geography course in 2000 and developing my own UNCA sustainability and security studies degree, Governor Cooper.

If special interests are omitting FCH2 in our state response or actively preventing positive FCH2 outcomes, that is just one sign we are limiting our contribution to a profitable and sustainable future. I see this blocking of FCH2 everywhere from the DOE Clean Cities programs in our state to Advanced Energy to the nonprofit / lobbying space. Despite NC Sustainable Energy Association (NCSEA) helping to get the Apple data center fuel cell system in Maiden, NC approved, NCSEA has a limiting approach to FCH2 and they were unwilling to allow me to participate meaningfully in HB 589 energy storage outcomes.

You and Secretary Regan with NC DEQ can add FCH2 with the VW settlement and the HB 589 energy storage study as starting points, Governor. Other nonprofits like Sierra Club, Southern Clean Energy Alliance, NC WARN, MountainTrue, or individuals like City of Asheville councilwoman Julie Mayfield and Buncombe commission chair Brownie Newman, are leaving a lot off the table, including FCH2. I can appreciate what these folks add, but there is plenty of blank space provided, especially by Duke Energy.

My goal is to see two hydrogen fueling stations in our state sooner rather than later. [One in Asheville and one in the RDU area](#). While the Hydrogen Power for North Carolina website is

light on content until my nonprofit develops, there is a good orientation PowerPoint on the homepage: HydrogenNC.com.

[Hydrogen is indeed one of the CleanTech energy storage solutions](#). While I don't know if hydrogen is stored at the Maiden, NC Apple data center power plant, this [fuel cell-biogas-solar microgrid is one of Apple's favorite examples of sustainability](#). There are hydrogen fueling stations in Greensboro and Spartanburg for fuel cell forklifts. There are 700 bar hydrogen fueling stations in Aiken, SC and along the NC-TN border at Charleston, TN for FCEVs like [Toyota's Mirai](#).

Don't be concerned about Japan competition as there are US manufacturers exploiting FCH2 markets, they just aren't in our state, Governor.

This week the DOE announced the cumulative [US FCEV sales have now totaled 2,748 units](#) since the modern next generation models hit the road in 2012-2014. There is little downside risk to installing two hydrogen fueling stations in our state and our strategic location on the US highway system would put us on a higher spot on the American energy innovation map, Sirs.

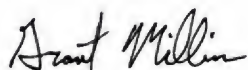
I have a range of research sources to establish the value of FCH2, Governor. In my Master of Project Management program we studied the world's most advanced CleanTech energy science program, [ITER](#).

You will see a 15 Megawatt stationary fuel cell microgrid in my presentation. Keep in mind 15 Megawatts of solar PV takes up much, much more area and is intermittent (sunshine required). And yet stationary fuel cells have negligible emissions of any kind because they do not burn natural gas. Electricity is made by any fuel cell in an electrochemical process. Yet Duke Energy is preventing North Carolina from utilizing this and many other CleanTech solutions for no reason that should matter to the rest of us, Governor. After all, they and the NCUC approved the Maiden Apple data center fuel cell system.

North Carolina is attempting a energy storage study which at present does not include for FCH2. I am asking to be an equal solution provider alongside the NC Policy Collaboratory, NCSEA, and all the others who are invested in HB 589. I cannot see where my position gets tossed aside in an arbitrary manner.

Please share any questions and where I fit in, Sir. I look forward to meeting you soon.

Best wishes,



Grant Millin, Innovation Strategist and Owner
InnoGraph - Strategic Innovation Services and Management Consulting
Sustain NC Developer

